ingots will be plunged into a pocket of cold and stagnant gas and therefore will not be heated uniformly, the top of the ingots being hotter than the bottom.

A number of designs for pit furnaces have been seen by the author, but none of them were perfectly satisfactory, and in many of them there were gross violations of the physical laws in regard to the carrying off of the waste gases. Fig. 112 shows a pit furnace of the " new Siemens system " of a very costly design. These pits are only supplied with regenerators for the air supply, regenerators for the gas being omitted. Therefore, the products of combustion cannot pass out of the heating chamber without passing through the air regenerators, which have a port sill or bridge wall extending to a height of 600 mm above the hearth of the pit (refer to the dotted line *A}.* It is very clear that the hearth of these pits forms a pocket which will be filled with colder

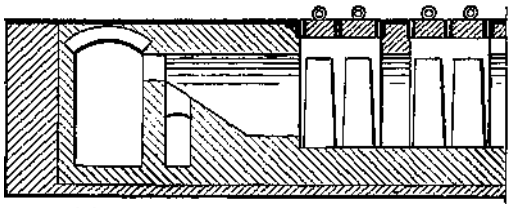

FIG. 113.

gases. Nothing can be done to save this furnace and make it heat properly. The walls were lowered between the pits until the

heir, as calculated by Yesmann's formula. After the furnace was reconstructed in this manner the pits worked, but the velocity of the gas in the heating chamber was equal to the velocity under a normal inverted weir, that is to say, one under which the height *h* equals 1 m, the velocity *v* being 6 m per second (refer to page 52). A velocity as high as this is unsatisfactory.

The hot gases did not remain in the heating chamber a sufficient length of time to give up their heat to the ingots. For this reason the fuel consumption of these pits was very large. The best means of reconstructing this furnace consists in removing the bridge wall in front of the regenerator for air, so that the bottom of this port will be as nearly as possible at the level of the hearth of the pits.

Fig. 113 shows Siemens type pit furnace at the Salda (Oural)

height *h* was equal to the velocity of the stream under the inverted weir